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croscopists was to be held in Chicago, beginning Aug. 7 and continuing four days.

— We have, for lack of space, failed to notice several recent geological papers of interest. These are Mr. G. K. Gilbert's Contributions to the History of Lake Bonneville, extracted from the annual report of the Director of the U. S. Geological Survey, 1880-81. It is finely illustrated and gives the results of several seasons' explorations. Professor W. M. Davis publishes in the Bulletin of the Museum of Comparative Zoölogy, Vol. VII, a well illustrated paper on the relations of the Triassic traps and sandstones of the Eastern United States; also a second paper on the folded Helderberg limestones east of the Catskills, with numerous diagrams.

— A monument to the memory of the celebrated naturalist and physio-philosopher, Oken, has been erected at Offenburg. Visitors to the University grounds at Jena will remember seeing his bust there, which has been on exhibition for many years.

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

PHILADELPHIA ACADEMY OF NATURAL SCIENCES, April 5.—Mr. Cresson exhibited some Aztec flageolets and whistles, and proved that by closing the bell of the flageolets with the little finger the entire octave could be produced. Each whistle was correctly pitched, and a series gave a complete octave, together with the ninth, eleventh, and twelfth. Mr. Cresson argued from these facts that the Aztecs were acquainted with the full musical scale, instead of being limited to the pentatonic scale, as has usually been believed to be the case with them and other barbarous nations. In the comparison of these instruments with the Boehm flute he was assisted by Professor J. S. Cox. Mr. Cresson also stated that he had examined the construction of these flageolets, and had endeavored to imitate it. He had reason to believe that the instrument was formed of four parts, the mouth-piece, the reed, the body, and the bell. Professor Lewis objected that though the entire scale can be produced by a skillful modern performer from a four-holed instrument, this did not prove that those who made the instrument possessed the skill and knowledge to produce it. Mr. Skinner showed some cocoons of the *Cecropia* moth gathered from the elder. Those taken from near the base of the shrub were of stouter form than those gathered from higher up, and always proved to be females, while the slimmer cocoons found on the higher branches always turned to male.

April 12.—Professor E. D. Cope gave particulars of recent palæontological discoveries in Brazil. Brazil consisted of two

islands until, at the end of the Cretaceous, the Andean range cut off the sea to the west. Since then a great Tertiary formation was laid down and the Amazon basin defined. The deposit made by the river and its branches is not older than the post-pliocene. Cretaceous strata occur near Pernambuco, and in these have been found the remains of several genera of sharks, and of a crocodile of the genus *Hyposaurus*, which occurs also in New Jersey; also a genus of rays (*Mesodaphus*). These remains indicate a horizon corresponding to the Maestricht chalk. A new pycnodont, *Pycnodus flabellatus*, had been found at Mapiri. In the lacustrine beds near Bahia many fish and saurians have been found, and crocodiles and dinosaurs, the former indicating a horizon above the Pernambuco beds also occur. He thought the age would prove to be near the Laramie. Some pampean beds near Bahia as yet have yielded only one fossil, *Toxodon expansidens*, sp. nov. A batrachian (*Aræarthrosus* Cope, gen. nov.) has been found in San Paolo, and is probably Permian, but may be Carboniferous. The pliocene vertebrates of Brazil are very distinct from those of North America, but the fossils now being studied indicate marked similarity in earlier periods.

April 18.—Professor Heilprin spoke of some invertebrate fossils from Santa Cruz, Patagonia. Tertiary deposits are traceable along nearly all the rivers of this region, and superimposed on those are the pampean shingle beds. The fossils greatly resemble those of N. Europe and Asia. Some forms are like those of our west coast. Dr. H. C. McCook spoke of the mode followed by orb-weaving spiders in making their snares. The foundation lines form an irregular polygon. After securing these the spider places the radiating lines alternately and almost opposite to each other, retiring to the center after making each attachment. This alternate opposition of the lines serves to strengthen the web. He believed the radii to be single lines. The converging point of the radii frequently seemed above the geometric center, probably to resist the spider's weight.

April 26.—Professor E. D. Cope described the head of *Diclonius mirabilis* Leidy, a saurian allied to the *Hadrosaurus* of the New Jersey marl. A nearly perfect skeleton from the Laramie beds of Dakota was in the speaker's possession. The head was bird-like in appearance, with spoon-like premaxillaries. Mr. Wortman expressed his belief that *Galera macrodon* from the Post-pliocene of Maryland should be placed in the genus *Putorius*, and dwelt on the relationships of the Mustelidæ; he did not attach much importance to color, size, and other individual variations. Dr. Horn exhibited a piece of bed-ticking from a bed the feathers in which had been destroyed by *Attagenus megatoma*. The interior surface of this ticking was converted into a fine plush by the penetration into the interstices of the material of the fine barboles of

the feathers. A discussion ensued as to the actual nature of the plush. Dr. Leidy described *Raphidiophrys socialis*, a heliozoön found in New Jersey. This animal occurred in groups of sometimes upwards of a hundred. They remained nearly stationary for as long as twenty-four hours, and fed upon two species of minute monads, which they swallowed like ordinary sun-animalcules.

May 3.—Dr. Leidy stated that examination of the plush exhibited at the last meeting had proved that it was really formed of feathers. Miss G. Lewis stated that she some years ago examined a similar material, known to have been formed from filaments of gull feathers, and that a cloak had been made of it that wore well. Professor Cope spoke of the characters of the molars of the Bunotherian mammals, and objected to Mivart's interpretation of their homologies. By comparison of recent and fossil forms, he concluded that the V's of the molars of the Insectivora had been formed in both jaws by the connection of cusps, and not by a flattening of tubercles, as may have been the case in animals having lateral motion of the jaws (as the Ungulates). He defined about seven series of forms based on the mutations of the tubercles. Professor Lewis read a paper by Miss Foulke upon a rotifer presumed to be new.

May 10.—Mr. J. Wilcox gave some interesting particulars respecting the surface soils of Canada, which are thin and poor, while water is scarce. He believed that the Laurentian rocks were once covered by sedimentary strata, since removed by erosion. The same speaker gave an account of the altered habits of the sheepshead and some other fishes in Florida. They enter fresh-water streams and feed on Conferva and other vegetable food. Professor Lewis read for Miss Foulke a description of a new species of rotifer, named by her *Floscularia articulata*.

May 17.—Dr. Clevenger, of Chicago, gave the result of his researches upon the valves in the vascular system. In a quadruped the horizontal veins of the trunk had no valves, while the vertical ones, those of the limbs and intercostal spaces, are furnished with them. In man precisely the same arrangement prevails, although the horizontal veins have become vertical and the vertical ones horizontal. He also alluded to the tendency to hernia produced by the want of strength in ligaments which in man had to bear the weight of the viscera; to the exposure of the femoral artery caused by man's erect position, and to the widening of the upper and narrowing of the lower rim of the pelvis from the constant strain brought to bear upon it, as another consequence of the erect position.